SEMESTER EXAMINATION, DECEMBER -2022

Course Name:- B.Tech **Semester:- 1st**

Paper Name:- Engineering Chemistry **Paper Code:- TBS 103**

Time - 2 Hrs + 20 minutes per hour extra time for V.I. & examinees with writer. **Max Marks-70**

समय– 2 घण्टे + 20 मिनट प्रति घंटे अतिरिक्त–दृष्टिबाधित एवं सह लेखक परीक्षार्थियों के लिए। अधिकतम अंक–70

Instructions:

- The question paper consists of three sections namely A, B, C. All sections are compulsory.
- Section A- Each question carries **04** marks. All questions are compulsory.
- Section B- Answer any **2 out of 4** given questions in maximum hundred **(150) words**. Each question carries **10 marks**.
- Section C- Answer any **2 out of 3** given questions in maximum five hundred **(250) words**. Each question carries **15 marks**.

निर्देश:

- प्रश्न पत्र में तीन खण्ड अ, ब, व स हैं। सभी खण्ड अनिवार्य हैं।
- खण्ड–अ में प्रत्येक प्रश्न **चार** अंक का है। सभी प्रश्न अनिवार्य हैं।
- खण्ड–ब में **चार** प्रश्नों में से किन्हीं **दो** प्रश्नों के उत्तर अधिकतम **डेढ़ सौ** (150) **शब्दों** में दें। प्रत्येक प्रश्न 10 अंक का है।
- खण्ड–स में **तीन** प्रश्नों में से किन्हीं **दो** प्रश्नों के उत्तर अधिकतम **ढाई सौ** (250) **शब्दों** में दें। प्रत्येक प्रश्न 15 अंक का है।

Section – A (खण्ड–अ)

Objective Questions(वस्तुनिष्ठ प्रश्न)

1. Answer all the following questions. **5×4=20**

निम्नलिखित सभी प्रश्न अनिवार्य हैं।

i) A water sample has 40ppm $CaSO_4$ and 50ppm $MgCO_3$ then total hardness value present is.

(a) 89 (c) 85

(b) 79 (d) 95

ii) Correct bond order of CO,CN, O_2, N_2 and F_2 is

(a) 3, 2.5, 3, 2, 1.5 (c) 3, 2.5, 2, 3, 1

(b) 3, 2, 2.5, 3, 1 (d) 3, 1.5, 2, 2.5, 3

iii) In the reaction NaCl (s) H2O (l) ------> NaCl.H2O (solution) at Boiling point temperature

No. of phase, components and degree of freedom is

(a) 3, 3, -2 (c) 2, 1, 1

(b) 2, 2, 2 (d) 3, 2, 1

iv) Lubricants used for railway tracks and tractor rollers are ----and ----- respectively?

(a) Grease and graphite (c) Heavy oil and graphite

(b) Graphite and grease (d) Heavy oil and grease

v) Which of the following is a cathode and anode respectively in the Ag-Fe system?

a) Iron (Fe) and Silver (Ag) c) Hydrogen (H_2) and Iron (Fe)

b) Silver (Ag) and Iron (Fe) d) Both (a) and (c) are possible

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Section – B (खण्ड–ब)
Short Answer Questions (लघुउत्तरीय प्रश्न)

2. Answer any two of the following questions in maximum 150 words. **10×2=20**
निम्नलिखित में से किन्हीं दो प्रश्नों के उत्तर अधिकतम 150 शब्दों में दें।

i) Discuss the Classification, Principle and Application of Lubricants.

ii) Discuss briefly about Galvanization and Tinning.

iii) Draw the MO diagram of F_2 and CN^-. Calculate their Bond order. Which one has a larger bond length and why?

iv) Explain Liquid Crystals and their applications in detail.

Section – C (खण्ड–स)
Descriptive Questions (विवरणात्मक प्रश्न)

3. Answer any two of the following question in maximum 250 words. **2×15=30**
निम्नलिखित में से किन्हीं दो प्रश्नों के उत्तर अधिकतम 250 शब्दों में दें।

i) With the help of chemical equations and figures explain about the "Ion exchange resin method" for removal of permanent hardness of water.

ii) Draw and discuss the "Phase diagram" of water. What is triple point of water?

iii) Give details about the % composition and various process involved in manufacturing of Portland cement in Rotary Kiln.

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